FIG.1

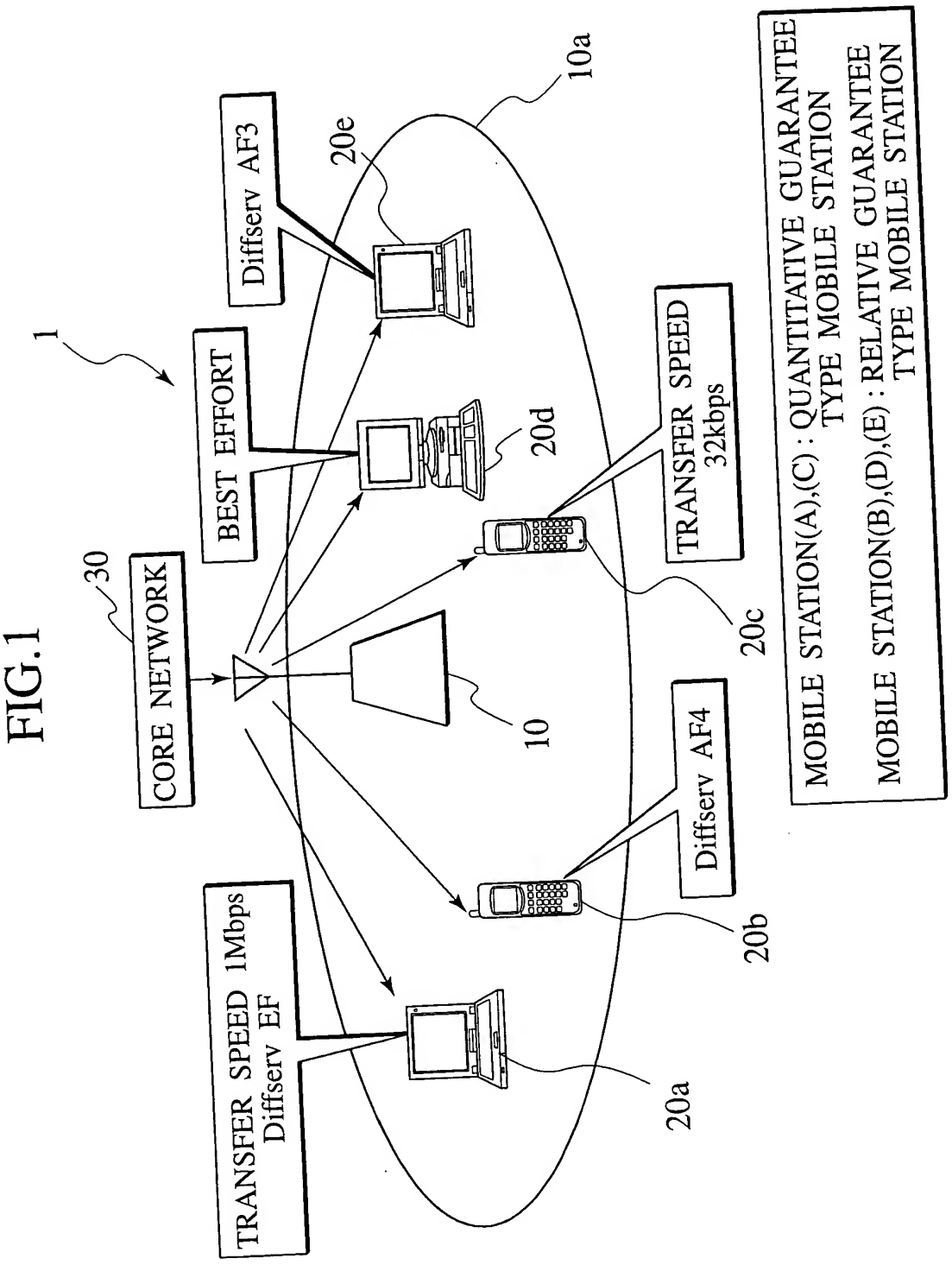
1
30
CORE NETWORK
BEST EFFORT
Diffserv AF3
10a
20e
20d
10
TRANSFER SPEED
32kbps
20c
Diffserv AF4
20b
TRANSFER SPEED 1Mbps
Diffserv EF
20a
MOBILE STATION(A),(C) : QUANTITATIVE GUARANTEE TYPE MOBILE STATION
MOBILE STATION(B),(D),(E) : RELATIVE GUARANTEE TYPE MOBILE STATION

FIG.2

TRAFFIC TYPE	DSCP	PRIORITY	REAL TIME QUALITY (EXAMPLE)
EF(EXPEDITED FORWARDING)	101110	TOP PRIORITY	REAL TIME(SOUND)
AF(ASSURED FORWARDING)	XXXYY0	NEXT PRIORITY FOLLOWING EF	AF4 : REAL TIME (MOVING IMAGE) AF1-3 : NOT REAL TIME
BE (BEST EFFORT)	000000	DOES NOT SUPPORT DIFFSERV COMMON TO ROUTER	NOT REAL TIME

FIG.3

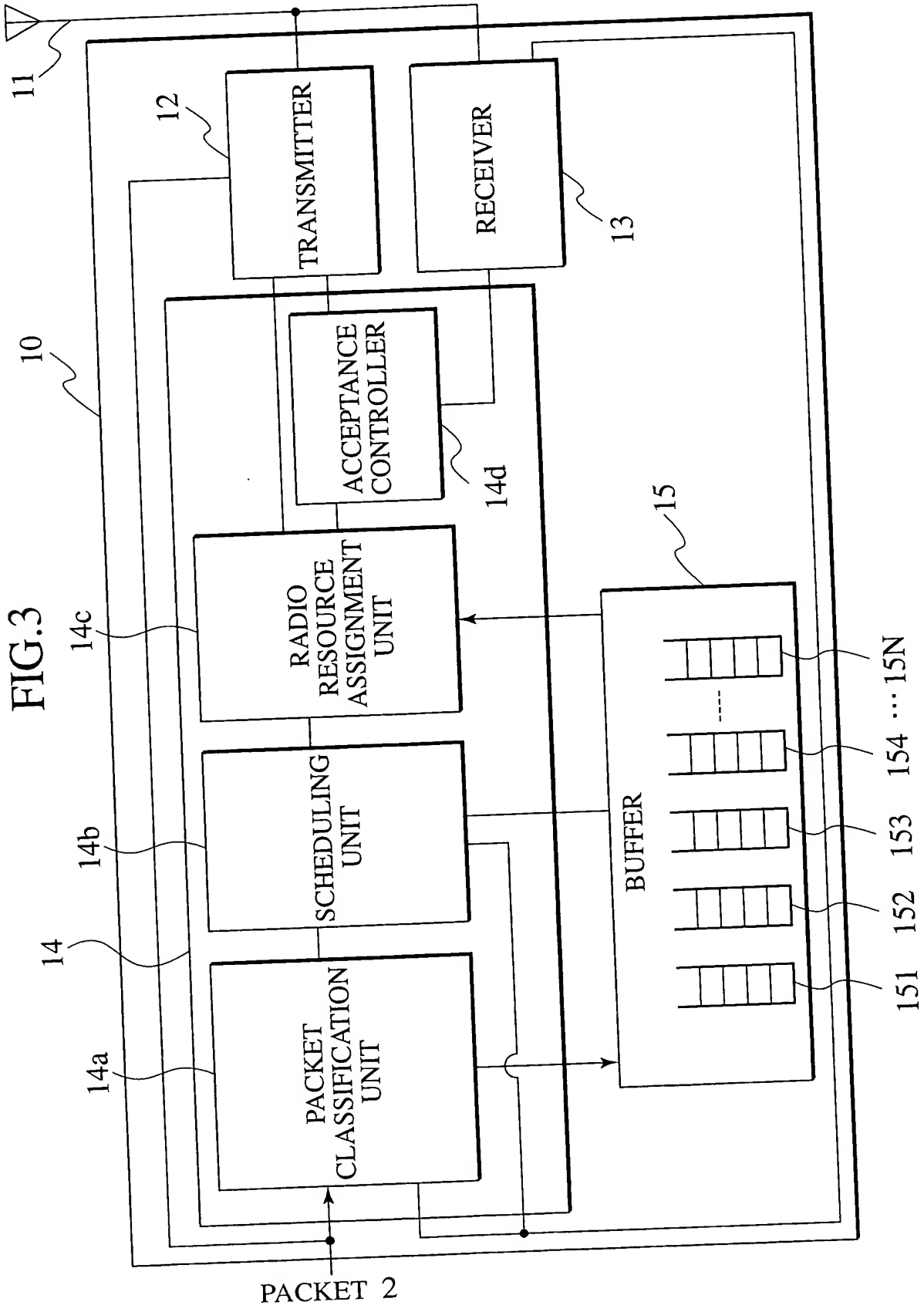
11
12
TRANSMITTER
RECEIVER
13
10
ACCEPTANCE CONTROLLER
14d
15
RADIO RESOURCE ASSIGNMENT UNIT
14c
SCHEDULING UNIT
14b
14
PACKET CLASSIFICATION UNIT
14a
BUFFER
151
152
153
154
15N
PACKET 2

FIG.4

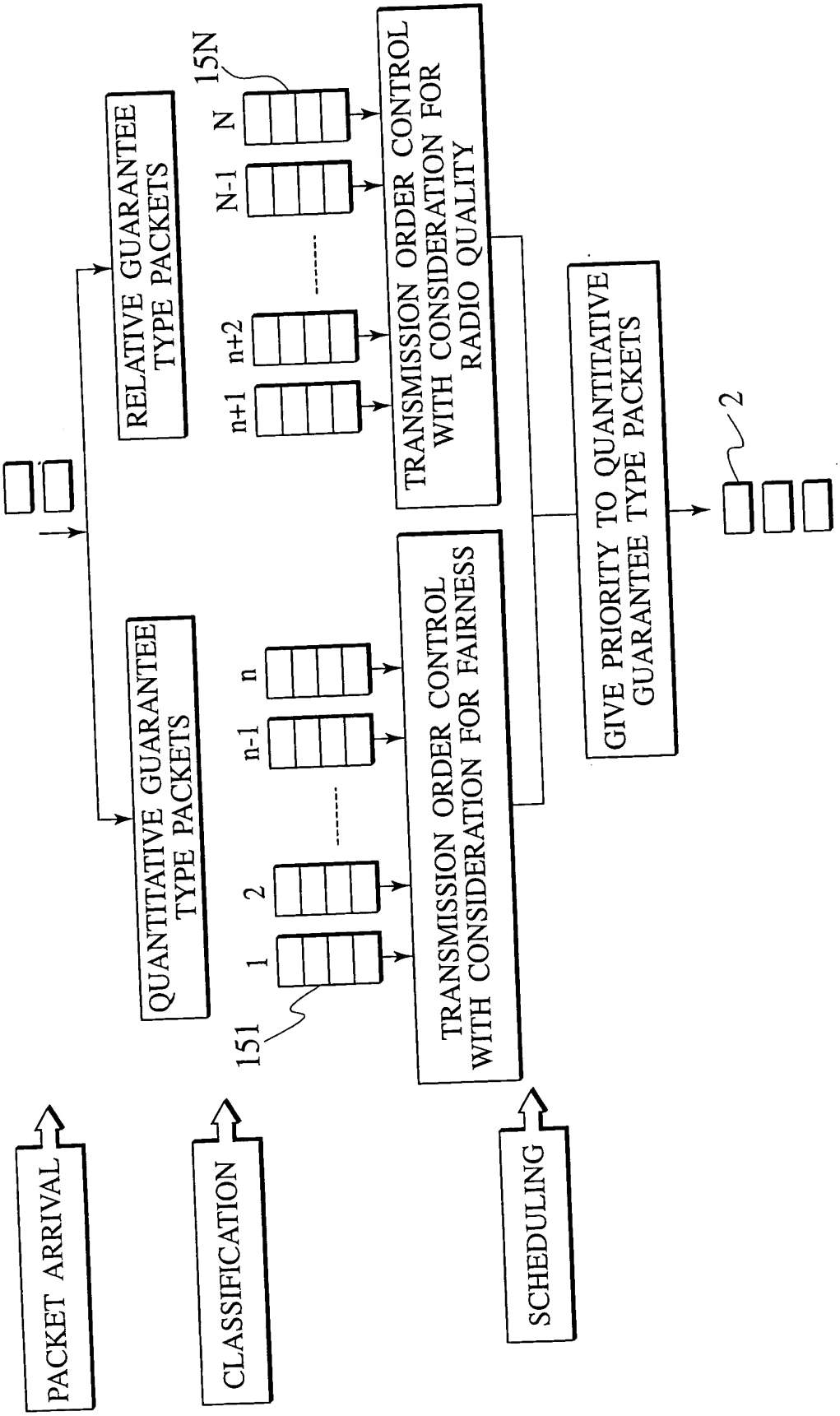
PACKET ARRIVAL
CLASSIFICATION
SCHEDULING
2
RELATIVE GUARANTEE TYPE PACKETS
QUANTITATIVE GUARANTEE TYPE PACKETS
151
1
2
n-1
n
n+1
n+2
N-1
N
15N
TRANSMISSION ORDER CONTROL WITH CONSIDERATION FOR FAIRNESS
TRANSMISSION ORDER CONTROL WITH CONSIDERATION FOR RADIO QUALITY
GIVE PRIORITY TO QUANTITATIVE GUARANTEE TYPE PACKETS
2

FIG.5

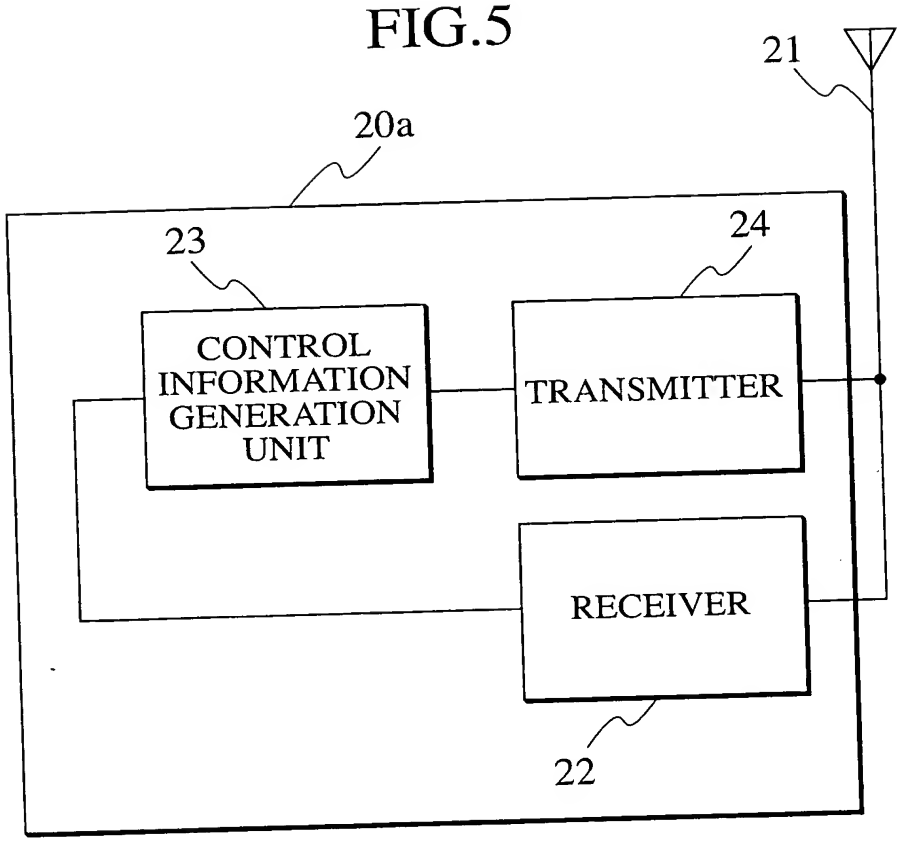
21
20a
23
24
CONTROL INFORMATION GENERATION UNIT
TRANSMITTER
RECEIVER
22

FIG.6

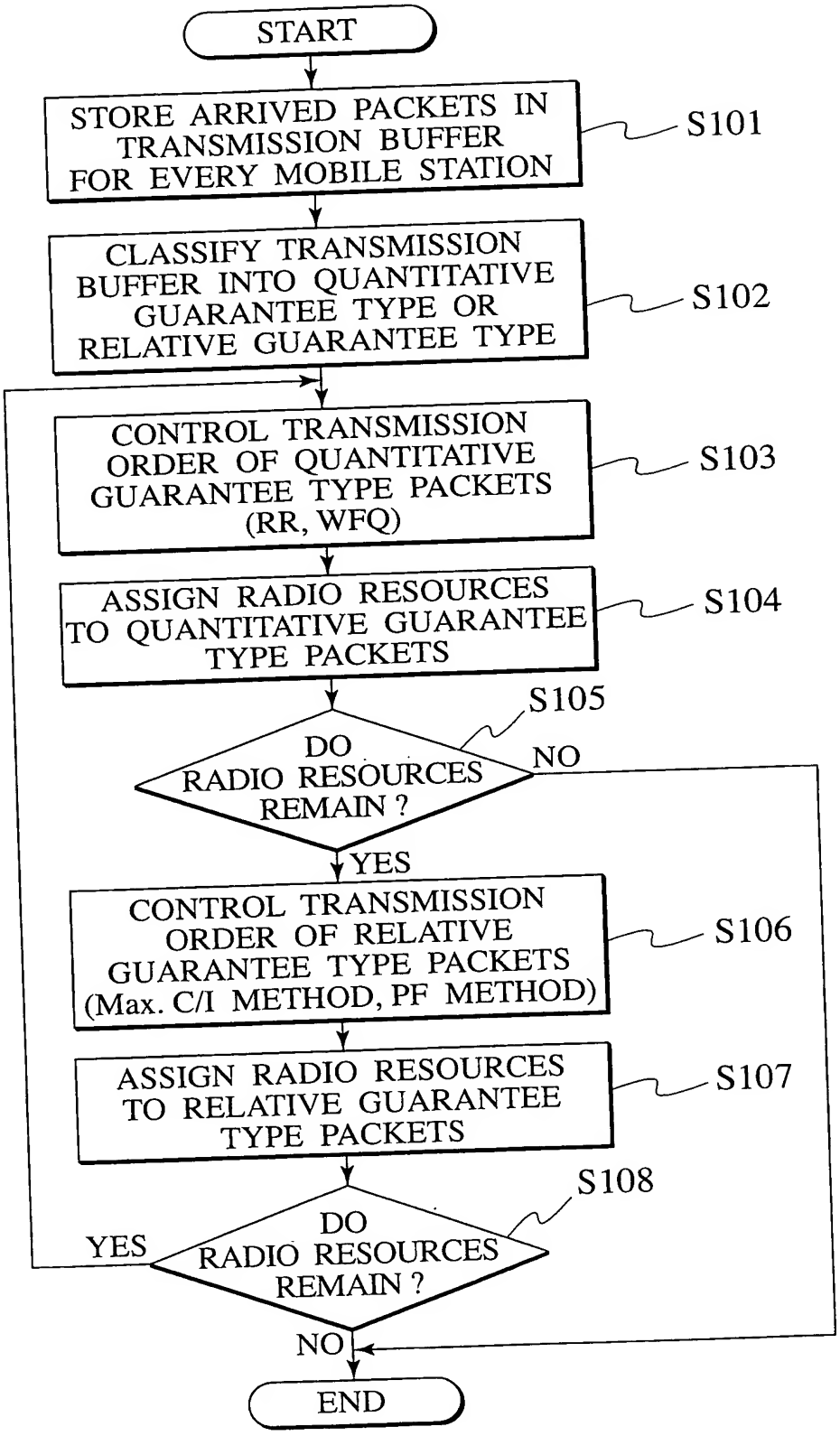
START
STORE ARRIVED PACKETS IN TRANSMISSION BUFFER FOR EVERY MOBILE STATION
S101
CLASSIFY TRANSMISSION BUFFER INTO QUANTITATIVE GUARANTEE TYPE OR RELATIVE GUARANTEE TYPE
S102
CONTROL TRANSMISSION ORDER OF QUANTITATIVE GUARANTEE TYPE PACKETS (RR, WFQ)
S103
ASSIGN RADIO RESOURCES TO QUANTITATIVE GUARANTEE TYPE PACKETS
S104
S105
DO RADIO RESOURCES REMAIN ?
NO
YES
CONTROL TRANSMISSION ORDER OF RELATIVE GUARANTEE TYPE PACKETS (Max. C/I METHOD, PF METHOD)
S106
ASSIGN RADIO RESOURCES TO RELATIVE GUARANTEE TYPE PACKETS
S107
S108
DO RADIO RESOURCES REMAIN ?
YES
NO
END

FIG.7

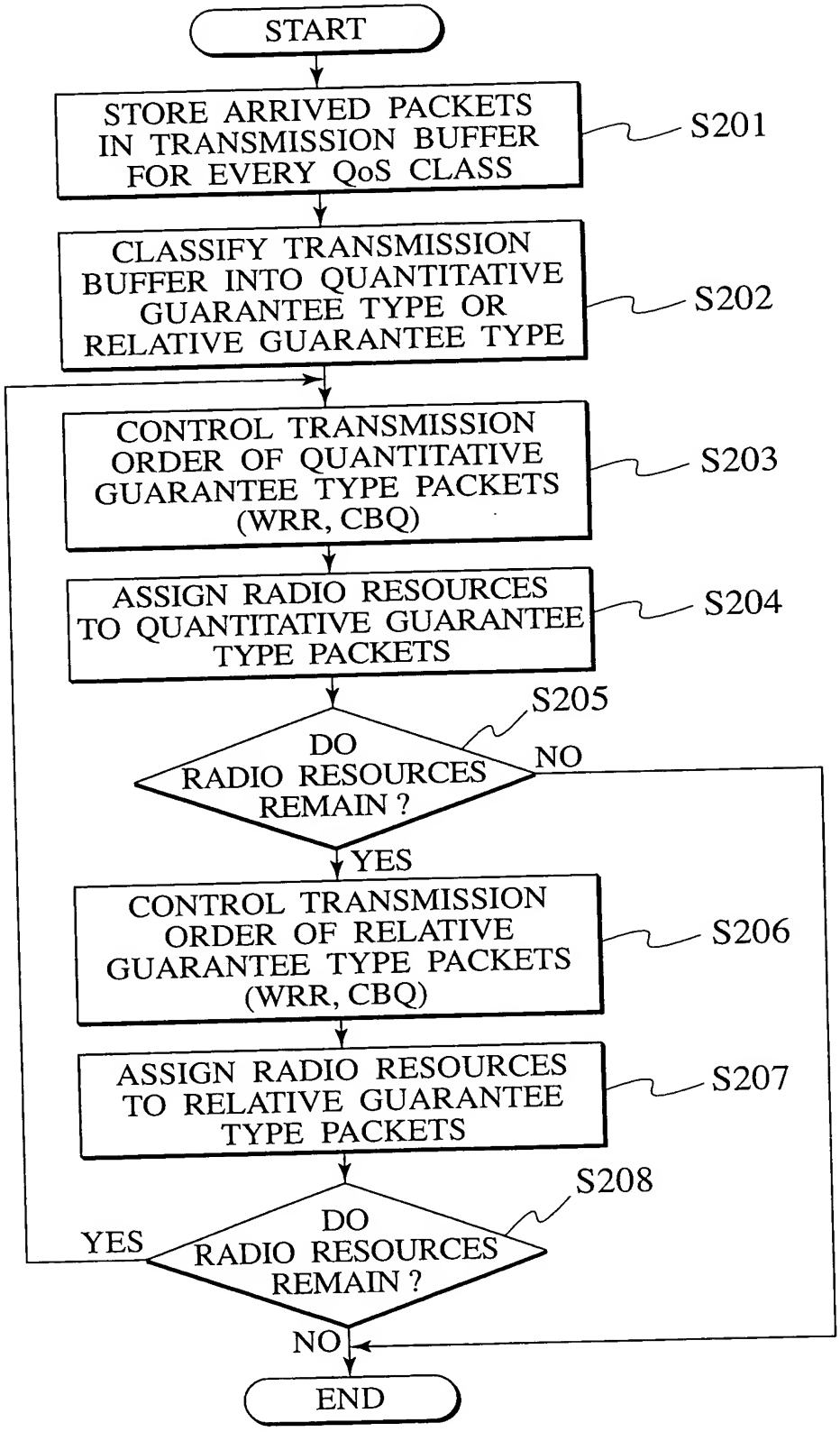
START
STORE ARRIVED PACKETS IN TRANSMISSION BUFFER FOR EVERY QoS CLASS
S201
CLASSIFY TRANSMISSION BUFFER INTO QUANTITATIVE GUARANTEE TYPE OR RELATIVE GUARANTEE TYPE
S202
CONTROL TRANSMISSION ORDER OF QUANTITATIVE GUARANTEE TYPE PACKETS (WRR, CBQ)
S203
ASSIGN RADIO RESOURCES TO QUANTITATIVE GUARANTEE TYPE PACKETS
S204
S205
DO RADIO RESOURCES REMAIN ?
NO
YES
CONTROL TRANSMISSION ORDER OF RELATIVE GUARANTEE TYPE PACKETS (WRR, CBQ)
S206
ASSIGN RADIO RESOURCES TO RELATIVE GUARANTEE TYPE PACKETS
S207
S208
DO RADIO RESOURCES REMAIN ?
YES
NO
END

FIG.8

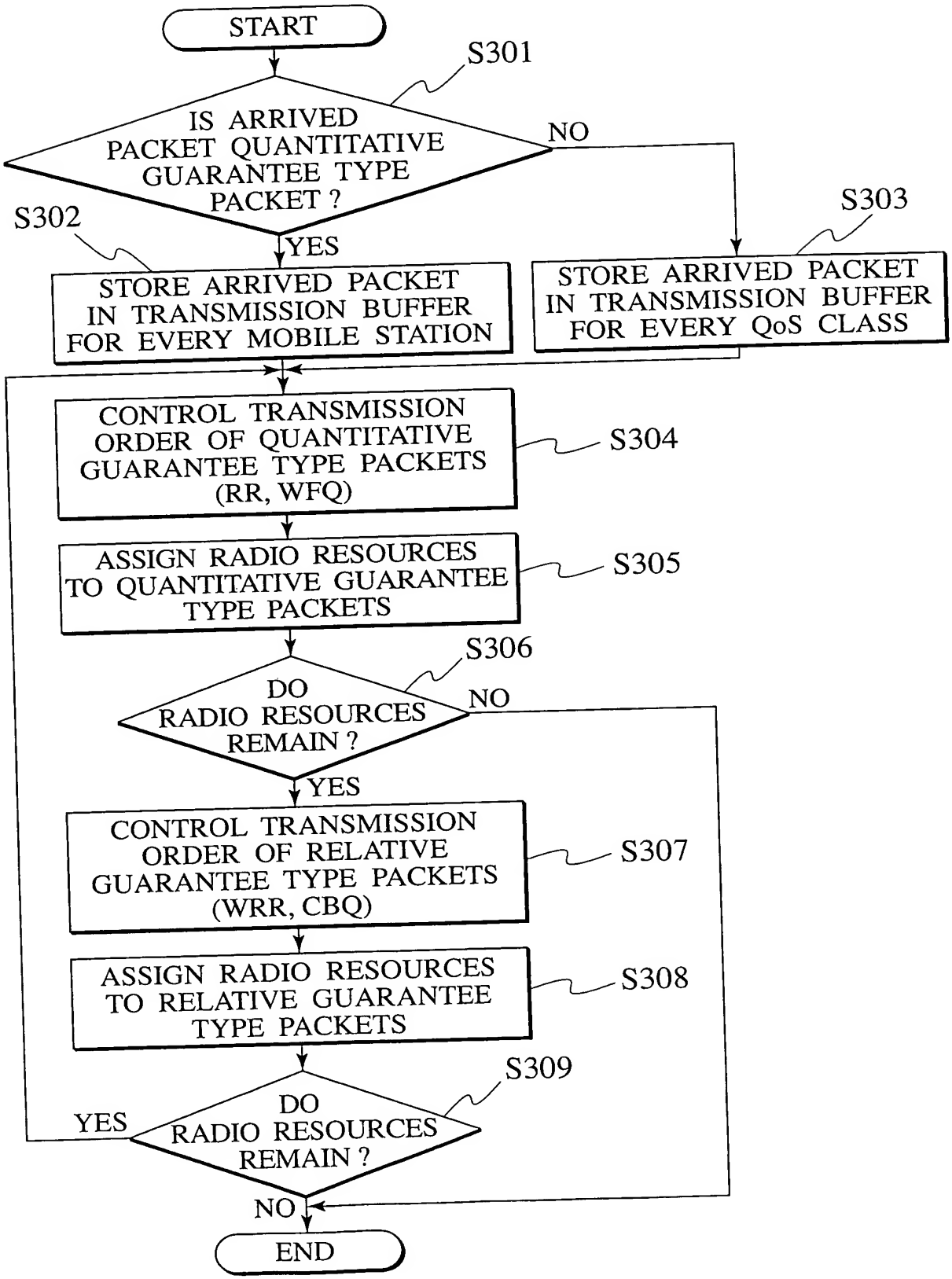
START
S301
IS ARRIVED PACKET QUANTITATIVE GUARANTEE TYPE PACKET ?
NO
YES
S302
STORE ARRIVED PACKET IN TRANSMISSION BUFFER FOR EVERY MOBILE STATION
S303
STORE ARRIVED PACKET IN TRANSMISSION BUFFER FOR EVERY QoS CLASS
CONTROL TRANSMISSION ORDER OF QUANTITATIVE GUARANTEE TYPE PACKETS (RR, WFQ)
S304
ASSIGN RADIO RESOURCES TO QUANTITATIVE GUARANTEE TYPE PACKETS
S305
S306
DO RADIO RESOURCES REMAIN ?
NO
YES
CONTROL TRANSMISSION ORDER OF RELATIVE GUARANTEE TYPE PACKETS (WRR, CBQ)
S307
ASSIGN RADIO RESOURCES TO RELATIVE GUARANTEE TYPE PACKETS
S308
S309
DO RADIO RESOURCES REMAIN ?
YES
NO
END

FIG.9

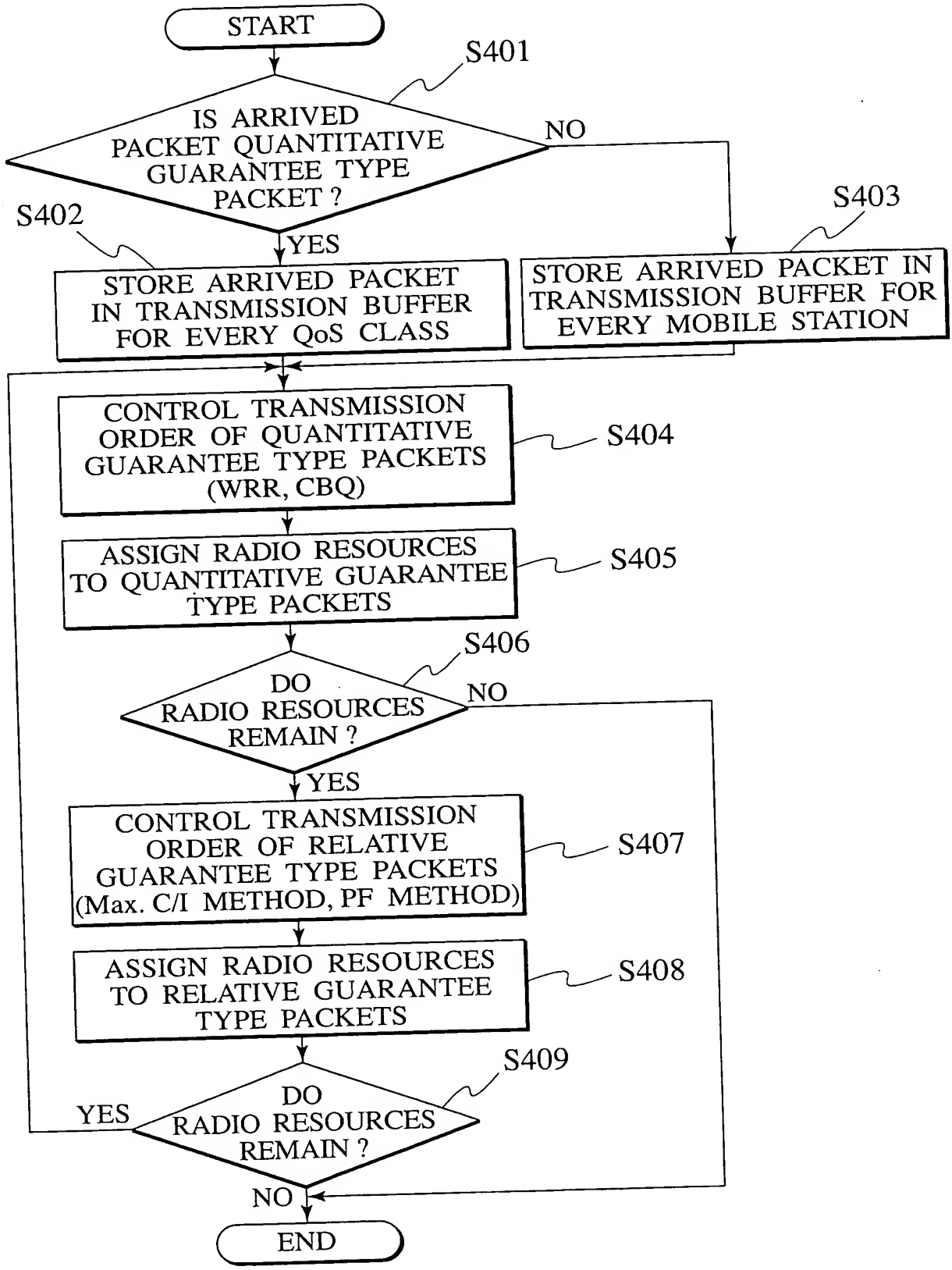
START
S401
IS ARRIVED PACKET QUANTITATIVE GUARANTEE TYPE PACKET ?
NO
YES
S402
STORE ARRIVED PACKET IN TRANSMISSION BUFFER FOR EVERY QoS CLASS
S403
STORE ARRIVED PACKET IN TRANSMISSION BUFFER FOR EVERY MOBILE STATION
CONTROL TRANSMISSION ORDER OF QUANTITATIVE GUARANTEE TYPE PACKETS (WRR, CBQ)
S404
ASSIGN RADIO RESOURCES TO QUANTITATIVE GUARANTEE TYPE PACKETS
S405
S406
DO RADIO RESOURCES REMAIN ?
NO
YES
CONTROL TRANSMISSION ORDER OF RELATIVE GUARANTEE TYPE PACKETS (Max. C/I METHOD, PF METHOD)
S407
ASSIGN RADIO RESOURCES TO RELATIVE GUARANTEE TYPE PACKETS
S408
S409
DO RADIO RESOURCES REMAIN ?
YES
NO
END

FIG.10

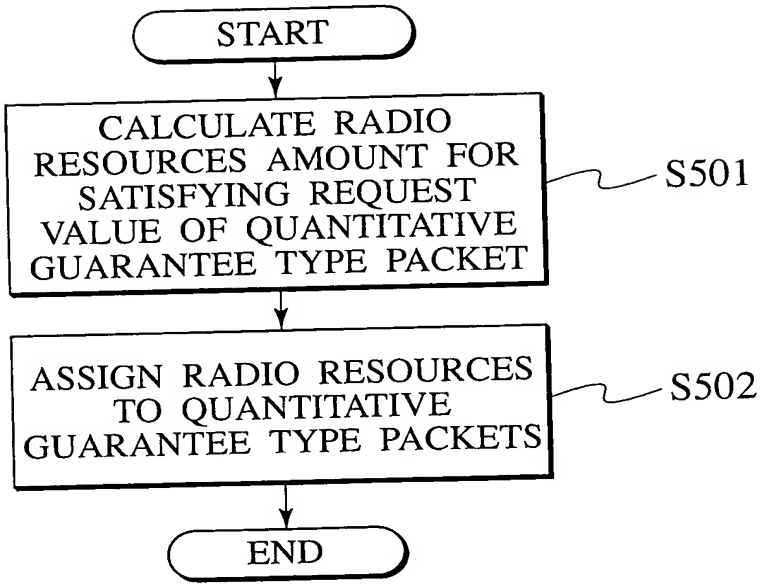
START
CALCULATE RADIO RESOURCES AMOUNT FOR SATISFYING REQUEST VALUE OF QUANTITATIVE GUARANTEE TYPE PACKET
S501
ASSIGN RADIO RESOURCES TO QUANTITATIVE GUARANTEE TYPE PACKETS
S502
END

FIG.12

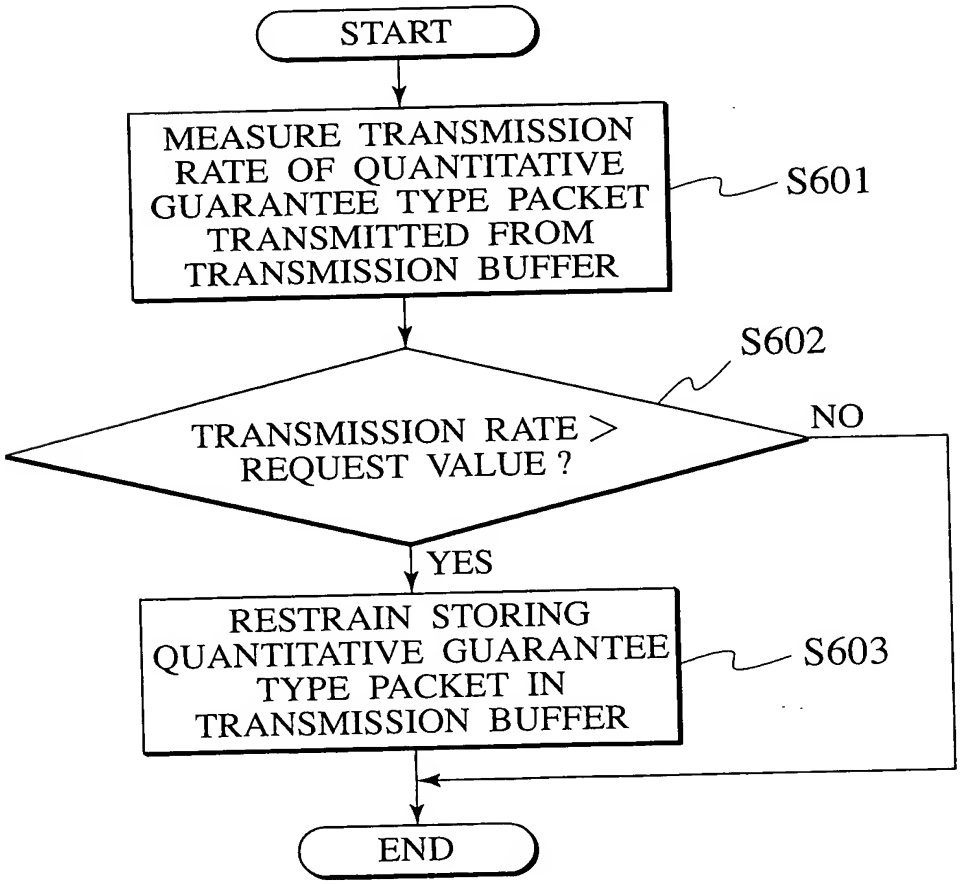
START
MEASURE TRANSMISSION RATE OF QUANTITATIVE GUARANTEE TYPE PACKET TRANSMITTED FROM TRANSMISSION BUFFER
S601
S602
TRANSMISSION RATE > REQUEST VALUE ?
NO
YES
RESTRAIN STORING QUANTITATIVE GUARANTEE TYPE PACKET IN TRANSMISSION BUFFER
S603
END

FIG.11

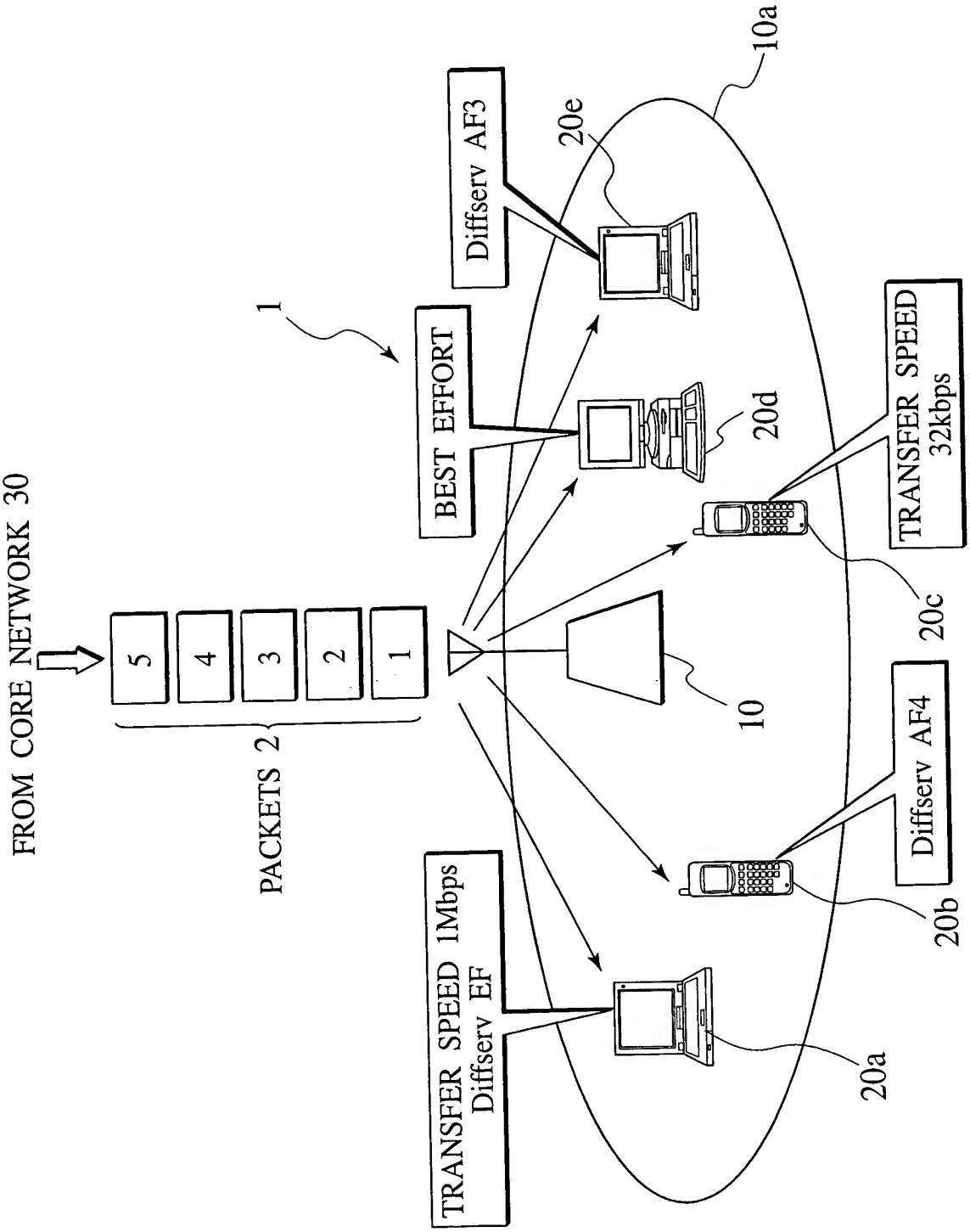
FROM CORE NETWORK 30
5
4
3
2
1
PACKETS 2
1
10
10a
BEST EFFORT
Diffserv AF3
TRANSFER SPEED 1Mbps
Diffserv EF
TRANSFER SPEED
32kbps
Diffserv AF4
20a
20b
20c
20d
20e

FIG.13

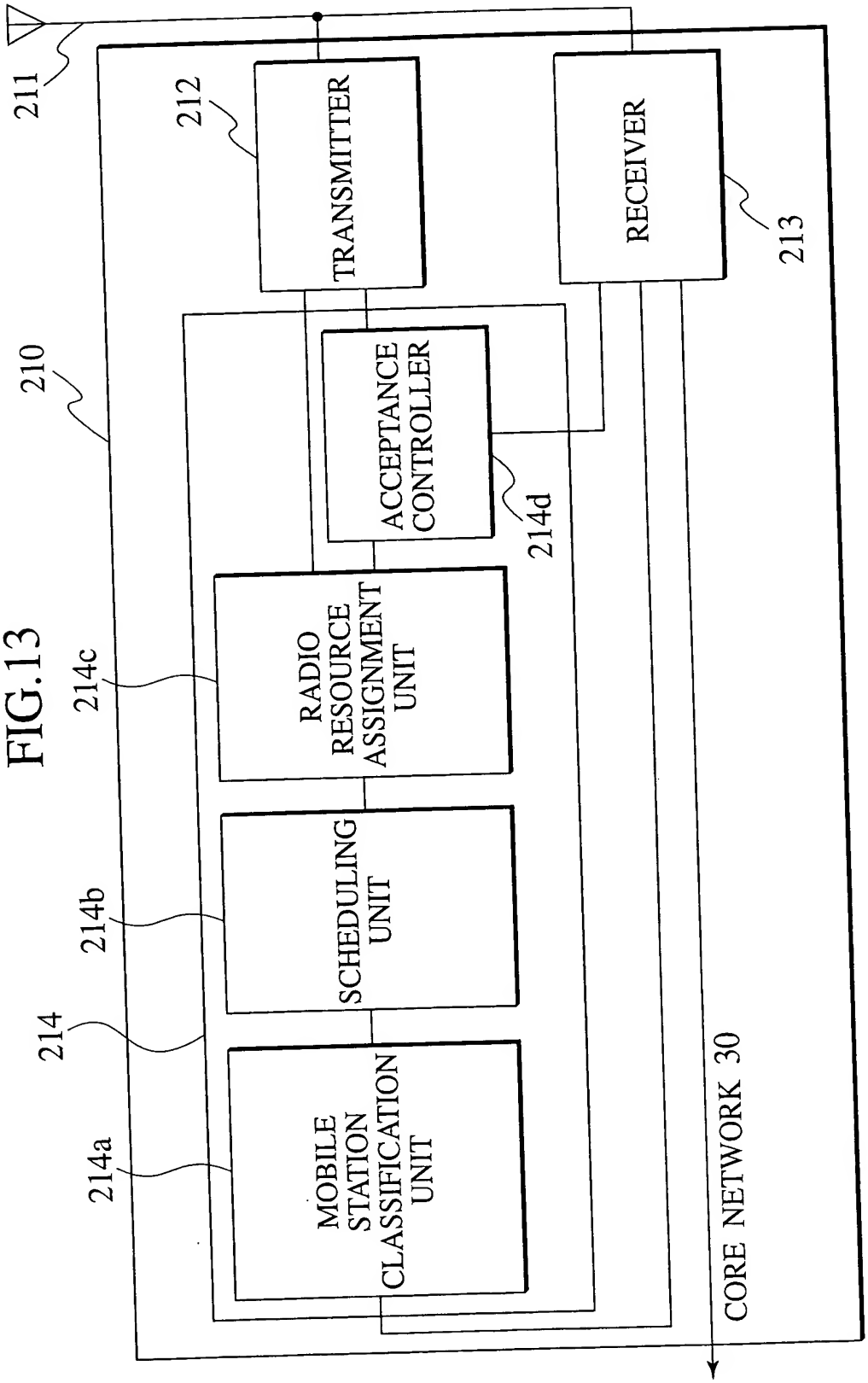
211
212
TRANSMITTER
RECEIVER
213
210
ACCEPTANCE CONTROLLER
214d
214c
RADIO RESOURCE ASSIGNMENT UNIT
214b
SCHEDULING UNIT
214
214a
MOBILE STATION CLASSIFICATION UNIT
CORE NETWORK 30

FIG.14

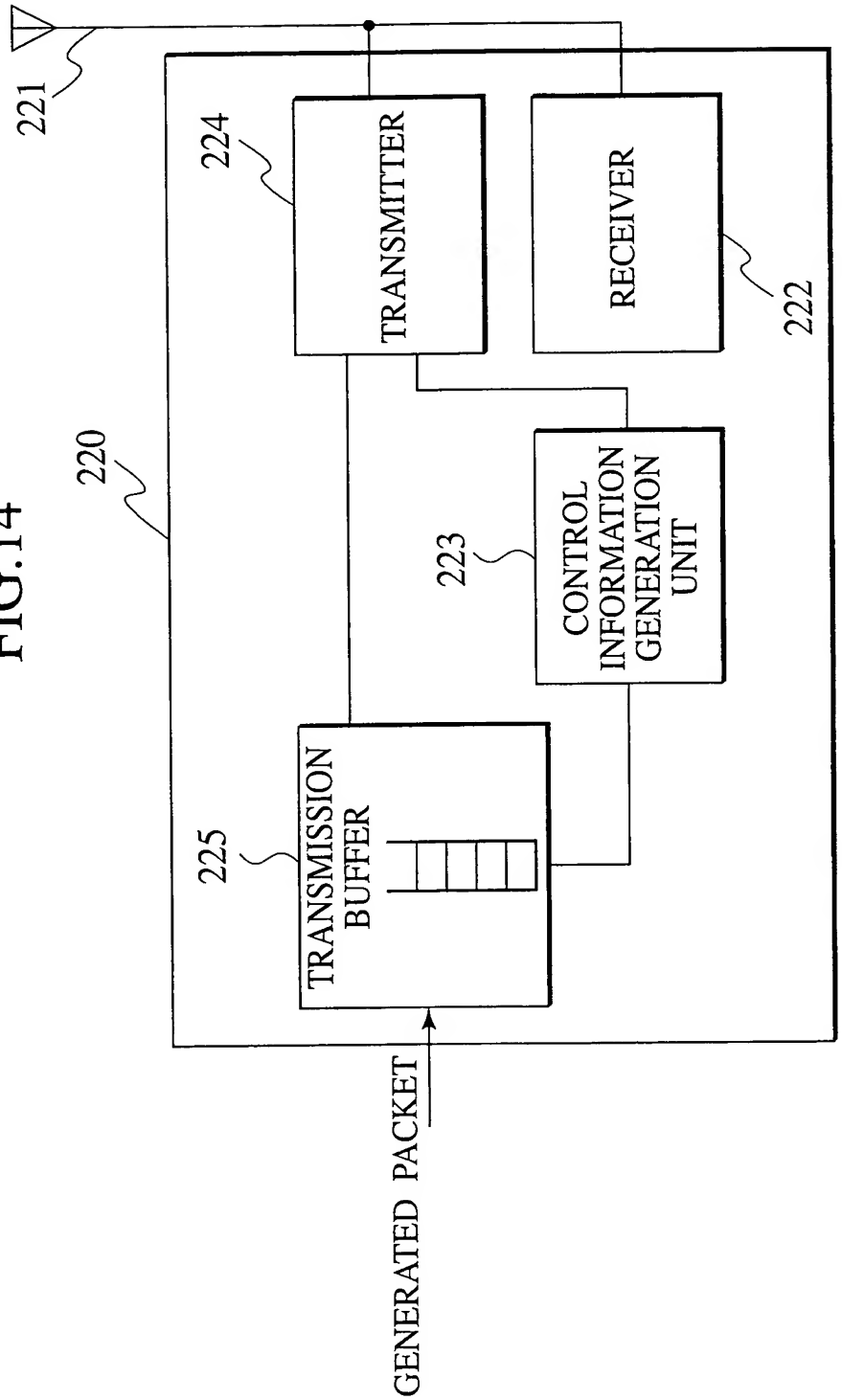
221
224
TRANSMITTER
RECEIVER
222
220
223
CONTROL INFORMATION GENERATION UNIT
225
TRANSMISSION BUFFER
GENERATED PACKET

FIG.15

	CONVERSATIONAL CLASS	STREAMING CLASS	INTERACTIVE CLASS	BACKGROUND CLASS
CHARACTERISTICS	· TWO-WAY COMMUNICATION SUCH AS SOUND · REAL TIME	· STREAMING WITH LITTLE DELAY IN SINGLE-WAY · REAL TIME	· REPLY WITHIN SPECIFIED PERIOD · LOW ERROR RATE · NOT REAL TIME	· NO REQUESTS FOR DELAY · LOW ERROR RATE · NOT REAL TIME
EXAMPLES	· VoIP · VIDEO CONFERENCE	· REAL TIME VIDEO STREAMING	· Web VIEWING · DATA BASE ACCESS	· ELECTRONIC MAIL · FILE TRANSFER
REQUIREMENTS FOR QoS	· MINIMUM DELAY · LITTLE JITTER	· LITTLE DELAY · LITTLE JITTER	· LIMITED DELAY VALUE · LOW BER	· LOW BER

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